

fine, I apprehend that in after years it will be thought worthier to have indicated, even if ineffectually, the proper course, than to have adopted effectual measures to prevent the proper course from being carried out.

Further Notes on Star-Gauging. and on the Principles on which its Interpretation should depend. By R. A. Proctor, B.A. Honorary Fellow of King's College.

From communications which have reached me, I am disposed to believe that some misapprehensions probably exist respecting the nature and objects of the processes of star-gauging which I have suggested as forming at present the best available means for determining the laws according to which the stellar universe is constituted. I therefore add some remarks which may be of use in explaining my views.

First, the great object of star-gauging with any given instrument is to ascertain how many stars *that instrument* shows in each portion of the heavens,—when the sky is clear and dark, and there is no twilight, moonlight, or other cause of variation in space-penetrating power. Great exactness in enumeration is by no means necessary. In fact, the effort to secure great exactness would certainly, by extending the time necessary for the work of survey, defeat the whole object of the work. What is required is a complete but rapidly effected survey, bearing the same relation to the actual charting of stars, that the reconnaissance of a land region bears to trigonometrical survey.

In interpreting results, attention must be directed, *first*, to the numerical distribution indicated by each particular instrument, such distribution being presented to the eye by the process of equal-surface charting; and, *secondly*, to the differential results indicated when a survey by any given instrument is compared with a survey by another instrument of greater or less space-penetrating power.

Unless both these orders of indication are considered, the star-gauging can afford no satisfactory information. This will be manifest if it be remembered that according to my views,—and I think I may say, according to the results I have demonstrated by equal-surface charts already constructed,—the great difficulty in all researches into the construction of the heavens consists in distinguishing the effects of star-distribution resulting, on the one hand, from great extension in the line of sight with consequent great variation in the apparent magnitude of stars of the same order, and on the other hand from the aggregation of many orders of real magnitude within one and the same region. These, of course, are only the extreme cases, and in nearly every instance, if not absolutely in every instance, both causes of varying apparent magnitude and closeness of aggregation are effective.

It is absolutely impossible in my opinion to distinguish one from the other, or to ascertain in what degree one or other operates, except by the proposed method of star-gauging, which combines, be it noticed, the qualities of the two methods suggested by Sir W. Herschel (one in 1784, the other in 1817), without being liable to the causes of error which exist in either of those methods. The general principles of interpretation, applicable not only to star-gaugings with different instruments, but to all differential observations, whether relating to colour, to duplicity triplicity or grouping generally, to spectrum, to motions whether thwart or in the line of sight, to peculiarities of configuration, to the various orders of nebulae, or so on, are simply these,—

(i.) Where two orders of observation indicate concordant laws of distribution over the heavens, the rich regions so indicated are regions of SPACE where the two orders of objects are intermingled so as to form parts of one system.

(ii.) Where the results are in direct contrast (or discordant in the true sense of the word*), the rich regions for one order corresponding to the poor regions for the other, and vice versa, the two orders of objects belong to one system, but some peculiarity in their nature, or in the laws according to which they were formed, causes them to occupy different parts of the system, segregating as it were from each other.

(iii.) Where no connexion whatever, either of agreement or contrast can be observed, it is probable, and in general presumable, that the two orders are altogether distinct and lie at different distances from each other.

And, lastly (iv.), whether partial or local agreement or contrast is indicated, then the inference is that the true arrangement of the objects in space is affected both by laws of aggregation or segregation and by diversities of distance, and by one cause or the other to a degree indicated by the extent of such agreement or contrast.

Note on the Expulsion Theory of the Solar Corona, Comets, &c., with special reference to Prof. Norton's original enunciation of that Theory. By Richard A. Proctor, B.A. (Cambridge), Honorary Fellow of King's College, London.

I have for some time intended to present to the Fellows of this Society a *résumé* and discussion of the papers of Prof. Nor-

* Which, however, is ordinarily used in too vague a way to be suitable as the converse of concordant.